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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,971	03/26/2004	Myunghee Lee	10030869-1	7901

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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/809,971	LEE ET AL.	
	Examiner	Art Unit	
	David S. Kim	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Applicant's response to the objection to the drawings in the previous Office Action (mailed on 16 January 2007) is noted and appreciated. The drawings were received on 04 April 2007. These drawings are approved. Accordingly, the previous objection is withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-2 and 7-9** are rejected under 35 U.S.C. 102(b) as being anticipated by Doh et al. (EP 1 187 373 A2, hereinafter "Doh").

Regarding claim 1, Doh discloses:

An optical receiver, comprising:

a photodetector (e.g., 11 in Fig. 1) receiving an optical signal and generating a corresponding current signal;

a gain stage (e.g., 12 and 13) coupled to the photodetector receiving the corresponding current signal and converting it to a corresponding voltage signal; and

a clock data recovery (CDR) circuit (e.g., 15) directly coupled to the gain stage receiving the corresponding voltage signal, extracting clock information from the corresponding voltage signal, and regenerating the corresponding voltage signal to reduce jitter (suppression of jitter in paragraph [0002]).

Regarding claim 2, Doh discloses:

An optical receiver as in claim 1, wherein the gain stage is a transimpedance amplifier circuit (transimpedance amplifier in paragraph [0003]) having a first frequency response (frequency response of some kind is inherent).

Regarding claim 7, Doh discloses:

A method for receiving an optical signal, comprising:

converting (e.g., 11 in Fig. 1) the optical signal into a corresponding current signal;

converting the corresponding current signal into a corresponding voltage signal with a gain stage (e.g., 12 and 13);

extracting clock information from the corresponding voltage signal (e.g., 15); and

regenerating the corresponding voltage signal to reduce jitter (regeneration of signal and suppression of jitter in paragraph [0002]).

Regarding claim 8, Doh discloses:

A method as in claim 7, further comprising:

(e.g., amplifiers 12 or 13) compensating for attenuation in the corresponding voltage signal, prior to extracting clock information.

Regarding claim 9, Doh discloses:

A method as in claim 8, wherein the gain stage is a transimpedance amplifier (transimpedance amplifier in paragraph [0003]) having a first frequency response (frequency response of some kind is inherent).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the

examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Doh.

Regarding claim 3, Doh does not expressly disclose:

An optical receiver as in claim 2, wherein the transimpedance amplifier circuit and the CDR circuit are formed on a single chip.

However, integration of circuitry is extremely well known in the art. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to form these circuits of Doh on a single chip. One of ordinary skill in the art would have been motivated to do this for common benefits of integration of circuits on a single chip, such as more compact size, economies of scale, and faster operation speeds.

7. **Claims 4-6 and 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Doh as applied to the claims above, and further in view of Swenson et al. (U.S. Patent Application Publication No. US 2005/0191059 A1, hereinafter "Swenson").

Regarding claim 4, Doh does not expressly disclose:

An optical receiver as in claim 2, further comprising:

a compensation circuit interposing the transimpedance amplifier circuit and the CDR circuit, the compensation circuit having a second frequency response that is approximately the inverse of the first frequency response of the transimpedance amplifier circuit.

However, Swenson discloses an optical receiver with a compensation circuit interposing a transimpedance amplifier circuit and a CDR circuit (Swenson, Fig. 3 in view of paragraph [0072]). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include such a compensation circuit in the receiver of Doh. One of ordinary skill in the art would have been motivated to do this to compensate the degradation of low-cost low speed components, such as the transimpedance amplifier (Swenson, components of paragraph [0037] in view of compensation/equalization of paragraphs [0038] and [0042]).

Additionally, it is standard practice to provide compensation/equalization of a first frequency response by using the corresponding inverse frequency response. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to arrange the compensation circuit of Doh in view of Swenson to have a second frequency response that is approximately the inverse of the first frequency response of the transimpedance amplifier circuit. One of ordinary skill in the art would have been motivated to do this since it is generally known that compensation/equalization using the inverse frequency response of a component/channel provides flat, clean signal results that signify the removal of degradation of that component/channel.

Regarding claim 5, Doh in view of Swenson discloses:

An optical receiver as in claim 2, further comprising:

a compensation circuit interposing the transimpedance amplifier circuit and the CDR circuit, wherein the compensation circuit is an equalizer (Swenson, equalizer in Fig. 3 in view of paragraph [0072]).

Regarding claim 6, Doh in view of Swenson discloses:

An optical receiver as in claim 5, wherein the equalizer includes a synthesis filter (Swenson, e.g., one can consider filter(s) 605 and/or 610 to "synthesize" a compensating signal).

Regarding claim 10, Doh in view of Swenson discloses:

A method as in claim 9, wherein compensating for attenuation is performed by a compensation circuit having a second frequency response that is approximately the inverse of the first frequency response (see treatment of claim 4 above).

Regarding claim 11, Doh in view of Swenson discloses:

A method as in claim 7, wherein the corresponding voltage signal is equalized, prior to extracting clock information (Swenson, equalizer in Fig. 3 in view of paragraph [0072], prior to CDR).

Response to Arguments

8. Applicant's arguments filed on 04 April 2007 have been fully considered but they are not persuasive. Applicant presents five salient points.

Regarding the first point, Applicant states:

"With regard to claim 1, Doh discloses, in Fig. 1, two separate and independent gain stages. The first gain stage, 12, is a low noise amplifier and the second gain stage, 13, is a limiting amplifier. An embodiment of this invention teaches the use of a clock data recovery block ('CDR') instead of using a second gain stage as shown in Fig. 1 of Doh. Because claim 1 does not require more than one gain stage, claim 1 is believed to be allowable.

For at least the above reason, Applicants request reconsideration and withdrawal of the rejection of Claim 1 under 35 U.S.C. § 102(b)...

With regard to claim 7, Doh discloses, in Fig. 1, two separate and independent gain stages. The first gain stage, 12, is a low noise amplifier and the second gain stage, 13, is a limiting amplifier. An embodiment of this invention teaches the use of a clock data recovery block ('CDR') instead of using a second gain stage as shown in Fig. 1 of Doh. Because claim 7 does not require more than one gain stage, claim 7 is believed to be allowable" (Remarks, p. 7-8).

Examiner respectfully notes that the standing rejections applied 12 and 13 *together* as a gain stage. In between photodiode 11 and CDR 15, components 12 and 13 *together* constitute a stage of gain.

Accordingly, Applicant's first point is not persuasive.

Regarding the second point, Applicant states:

"Concerning Claim 4, appellants respectfully assert that the Examiner has failed to establish a *prima facie* case of obviousness because, among other reasons, there is no suggestion or motivation to combine the reference teachings as proposed by the Examiner. In the rejection, the Examiner asserts that all of the elements of appellants' claim 4 can be found in the prior art references. This, however, is *not* the proper test for obviousness.

'It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the elements.'

Arkie Lures, Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 957, 43 USPQ2d 1294, 1297 (Fed. Cir. 1997).

The Examiner has provided no basis for a teaching or suggestion in the prior ad for combining elements as proposed in the rejection. The Examiner's argument regarding obviousness is as follows:

...it would have been obvious to one of ordinary skill in the art to include such a compensation circuit in the receiver of Doh. One of ordinary skill in the art would have been *motivated to do this to compensate the degradation of low-cost low speed components*, such as the transimpedance amplier...

(Office action, page 4, emphasis added)

The italicized words above represent the Examiner's only explanation regarding a teaching or suggestion to combine. These words, however, are simply an *unsupported statement* made by the Examiner. In order to establish a *prima facie* case, a teaching or suggestion to combine must be found *in the prior art*. See, *e.g., Arkie Lures, Inc. v. Gene Larew Tackle, Inc., supra*" (Remarks, p. 9-10, emphasis Applicant's).

Examiner respectfully notes that the standing rejections did present teachings and suggestions for the combination. That is, Applicant's second point does not address the reference to Swenson in the previous

rejection (mailed on 16 January 2007, p. 5, 1st two lines): Swenson, components of paragraph [0037] in view of compensation/equalization of paragraphs [0038] and [0042]. More exactly, paragraph [0037] of Swenson discloses low-cost components, including a transimpedance amplifier. Paragraphs [0038] and [0042] of Swenson teach that low-cost components introduce distortion and signal degradation. Paragraphs [0038] and [0042] of Swenson also teach that this distortion and signal degradation can be compensated by an equalizer. Fig. 3 of Swenson shows such placement of an equalizer 390 interposing a transimpedance circuit 360 and a CDR circuit 380. Doh's gain stage comprises a transimpedance amplifier (Doh, paragraph [0003]) and a CDR circuit (Doh, CDR 15 in Fig. 1). In view of Swenson, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to place an equalizer interposing the transimpedance circuit and CDR circuit of Doh. One of ordinary skill in the art would have been motivated to do this to compensate the distortion and signal degradation that is introduced low-cost components, such as a transimpedance amplifier. Accordingly, Applicant's second point is not persuasive.

Regarding the third point, Applicant states:

"In addition the Examiner's argument regarding obviousness with respect to claim 4 is as follows:

> ...it would have been obvious to one of ordinary skill in the art to arrange the compensation circuit of Doh in view of Swensen to have a second frequency response that is approximately the inverse of the first frequency response of the transimpedance amplifier circuit. One of ordinary skill in the art would have been motivated to do this since *it is generally known that compensation/equalization using the inverse frequency response of a component/channel provides flat, clean signal results that signify the removal of degradation of that component/channel.*
>
> (Office action, page 5, emphasis added)

The italicized words above represent the Examiner's only explanation regarding a teaching or suggestion to combine. These words, however, are simply an *unsupported statement* made by the Examiner. In order to establish a *prima facie* case, a teaching or suggestion to combine must be found *in the prior art*. See, *e.g., Arkie Lures, Inc v. Gene Larew Tackle, Inc., supra.*

For at least the above reasons, Applicants request reconsideration and withdrawal of the rejection of Claim 4 under 35 U.S.C. § 103(a)" (Remarks, p. 10-11, emphasis Applicant's).

"The Examiner indicates (page 5 of Office Action) that Claim 10 is rejected as being unpatentable over Doh in view of Swenson for the same reasons he gave in Claim 4.

Concerning Claim 10, appellants respectfully assert that the Examiner has failed to establish a *prima facie* case of obviousness because, among other reasons, there is no suggestion

or motivation to combine the reference teachings as proposed by the Examiner. In the rejection, the Examiner asserts that all of the elements of appellants' claim 4 can be found in the prior art references. This, however, is *not* the proper test for obviousness.

> 'It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the elements.'
>
> *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 119 F.3d 953, 957, 43 USPQ2d 1294, 1297 (Fed. Cir. 1997).

The Examiner has provided no basis for a teaching or suggestion in the prior art for combining elements as proposed in the rejection. The Examiner's argument regarding obviousness is as follows:

> At the time the invention was made, it would have been obvious to one of ordinary skill in the art to arrange the compensation circuit of Doh in view of Swensen *to have a second frequency response that is approximately the inverse of the first frequency response of the transimpedance amplifier circuit.*
>
> (Office action, page 5, emphasis added)

The italicized words above represent the Examiner's only explanation regarding a teaching or suggestion to combine. These words, however, are simply an *unsupported statement* made by the Examiner. In order to establish a *prima facie* case, a teaching or suggestion to combine must be found *in the prior art*. See, *e.g., Arkie Lures, Inc. v. Gene Larew Tackle, Inc., supra*" (Remarks, p. 12-13, emphasis Applicant's).

Examiner respectfully notes that this teaching *is* known in the prior art. Notice the equalization teachings from Sklar (*Digital Communications: Fundamentals and Applications, 2nd ed.*) on p. 149-151 under section 3.4.1 Channel Characterization, especially the portion on p. 151. Moreover, Applicant's third point does not address the merits of the combination. Accordingly, Applicant's third point is not persuasive.

Regarding the fourth point, Applicant states:

> "The Examiner indicates (page 5 of Office Action) that Claim 5 is rejected as being unpatentable over Doh in view of Swenson because an equalizer is shown in Fig. 3 in view of paragraph [0072]. Neither Doh nor Swenson individually or combined teach or suggest interposing the transimpedance amplifier circuit and the CDR circuit, wherein the compensation circuit is an equalizer. In order to establish a *prima facie* case, a teaching or suggestion to combine must be found *in the prior art*. See, *e.g., Arkie Lures, Inc. v. Gene Larew Tackle, Inc., supra*.
>
> For at least the above reasons, Applicants request reconsideration and withdrawal of the rejection of Claim 5 under 35 U.S.C. § 103(a)" (Remarks, p. 11, emphasis Applicant's).

> "The Examiner indicates (page 5 of Office Action) that Claim 11 is rejected as being unpatentable over Doh in view of Swenson because an equalizer is shown in Fig. 3 in view of paragraph [0072]. Neither Doh nor Swenson individually or combined teach or suggest interposing the transimpedance amplifier circuit and the CDR circuit, wherein the compensation circuit is an equalizer. In order to establish a *prima facie* case, a teaching or suggestion to

> combine must be found *in the prior art*. See, *e.g., Arkie Lures, Inc. v. Gene Larew Tackle, Inc., supra.*
>
> For at least the above reasons, Applicants request reconsideration and withdrawal of the rejection of Claim 11 under 35 U.S.C. § 103(a)" (Remarks, p. 13, emphasis Applicant's).

Examiner respectfully notes that this teaching *is* known in the prior art. In Swenson, notice equalizer 390 interposing transimpedance amplifier 360 and CDR circuit 380 in Fig. 3. Accordingly, Applicant's fourth point is not persuasive.

Regarding the fifth point, Applicant states:

> "The Examiner indicates (page 5 of Office Action) that Claim 6 is rejected as being unpatentable over Doh in view of Swenson because he considers filter(s) 605 and/or 610 to synthesize a compensating signal. Neither Doh nor Swenson individually or combined teach or suggest an equalizer that includes a synthesis filter. In order to establish a *prima facie* case, a teaching or suggestion to combine must be found *in the prior art*. See, *e.g., Arkie Lures, Inc. v. Gene Larew Tackle, Inc., supra.*
>
> For at least the above reasons, Applicants request reconsideration and withdrawal of the rejection of Claim 6 under 35 U.S.C. § 103(a)" (Remarks, p. 11-12, emphasis Applicant's).

Examiner respectfully notes that this teaching *is* known in the prior art. In Swenson, notice that filter 610 synthesizes a number of compensating signals (any suitable signal output from the coefficient symbols) in Fig. 6. As Applicant characterizes a synthesis filter as producing a compensating signal (Applicant's specification, paragraph [0016]), Swenson's filter 610 would constitute a synthesis filter. Accordingly, Applicant's fifth point is not persuasive.

Summarily, Applicant's arguments are not persuasive. Accordingly, Examiner respectfully maintains the standing rejections.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSK

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER

Approved by DSK
12 JUNE 2007

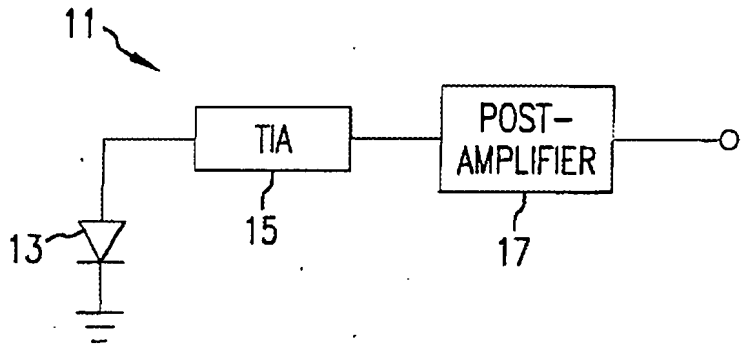

FIG. 1

PRIOR ART

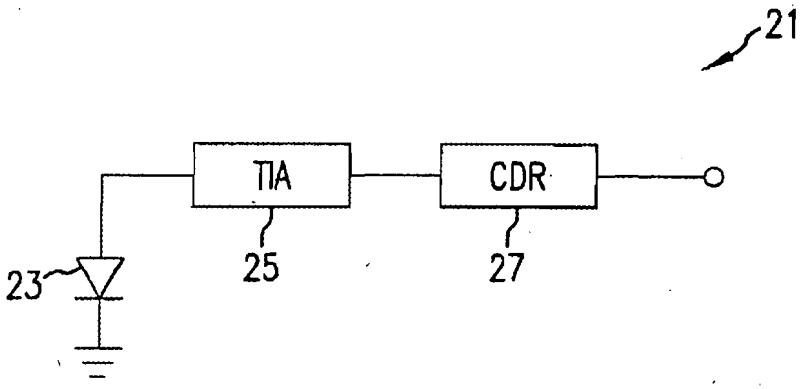

FIG. 2

Approved by PSK
12 JUNE 2007

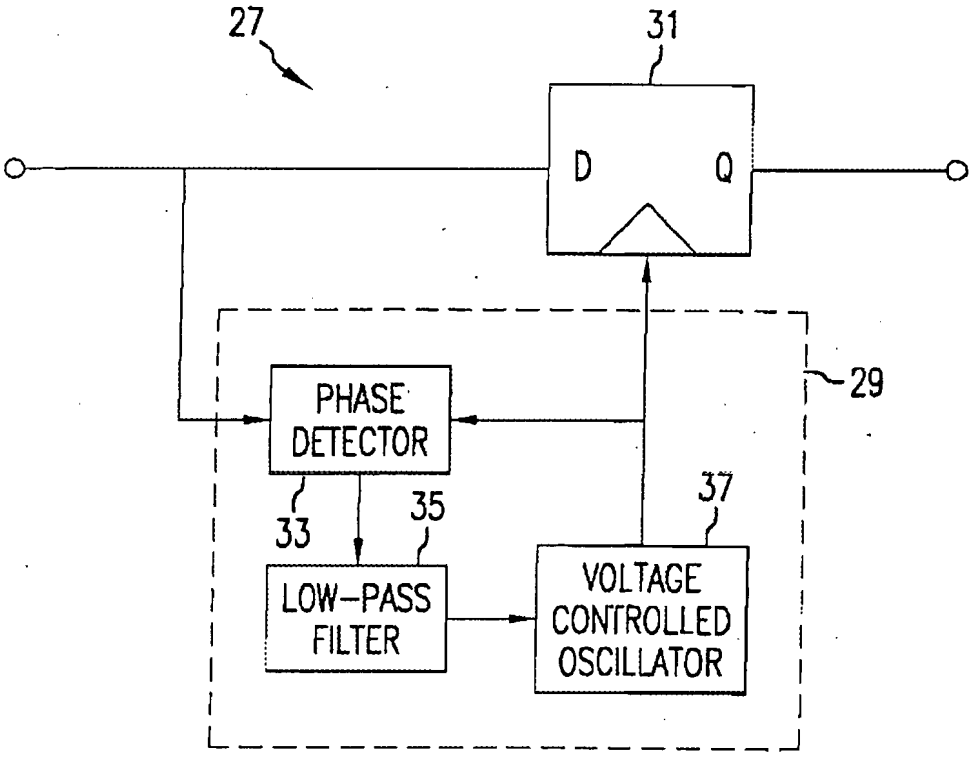

FIG.3

PRIOR ART

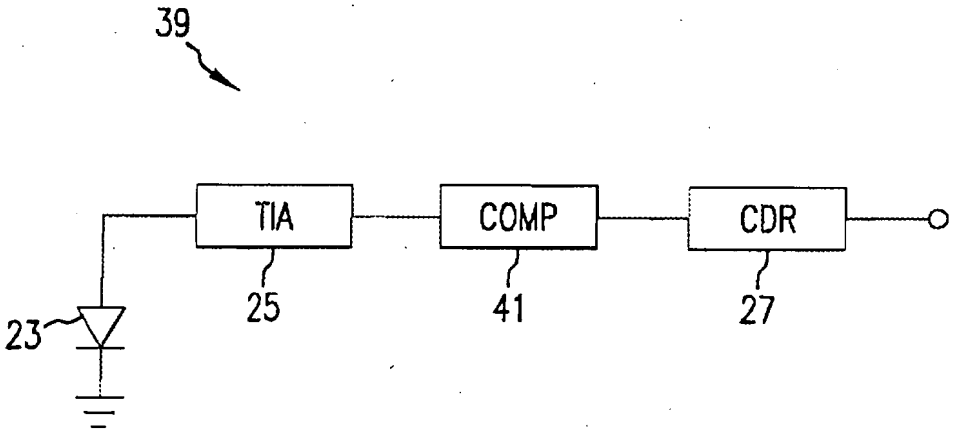

FIG.4

Approved by DSK
12 JUNE 2007

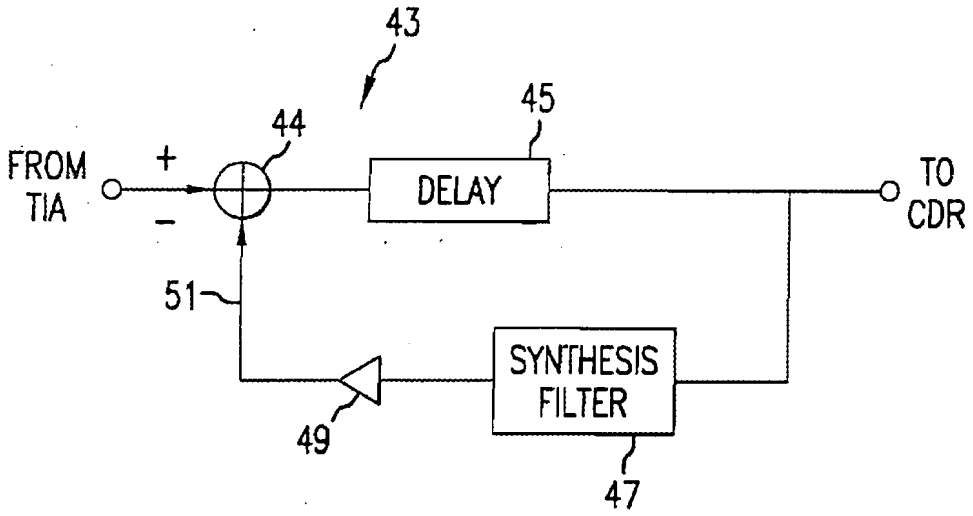

FIG.5

PRIOR ART